PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY

MEETING OF JANUARY 19, 1932

A regular meeting of the New York Entomological Society was held on January 19, 1932, in the American Museum of Natural History; President Andrew J. Mutchler in the chair with twenty-one members and thirty-seven visitors present.

The minutes of the preceding meeting were approved as read and corrected.

In the absence of Mr. Hall, Mr. Bell read the treasurer's report for 1931.

On hand December, 1930	$ 1676.21
On hand December, 1931	1754.76
Received	2550.37
Expenses	2471.82
Gain during 1931	78.55

The report was accepted with thanks and placed on file.

The program committee reported Dr. Creighton and Dr. Driggers as the speakers for the next meeting.

Dr. Byrley F. Driggers, of the New Jersey Experiment Station at New Brunswick, was proposed for membership in the society.

Dr. William Moore read his paper on "Chemical Stimuli and Receptors," the second in the Biology of Insects series. Odors as chemical stimuli are stronger than taste. Certain odors, such as ethyl acetate, sugars, etc., are responsible for a food grasping reaction, others such as ammonia cause the reaction of oviposition, and the odor of eugenol is attractive to the male only. The organs that detect these odors are receptors or sense cells. They are found in the antennæ or all over the body, scientists not agreeing as to their location. It is difficult to ascertain the reactions caused by taste. Minnich has carried on several experiments to prove the sensitivity of the red admiral butterfly to cider in which he found taste receptors in the legs of the butterfly.

Professor C. L. Fluke, of the University of Wisconsin, then spoke on "Some Fly Friends and Enemies in Wisconsin," the Syrphidæ being the friends and the apple maggots the enemies. The syrphid larvæ, *Allograpta obliqua, Syrphus torvus,* and *Mesogramma geminata* live on a diet of plant lice and pea aphids. These larvæ have been observed to increase after an aphid attack. If the aphid food is missing in their diet, they complete their development more quickly but are undersized when they emerge. Dr. Fluke also mentioned the great numbers of aphids devoured by Chrysopa and the Coccinellidæ. Dr. Fluke showed a series of slides on the life history and the habits of the syrphid larvæ and also on the damage done by the apple maggot and the measures taken to rid the Wisconsin orchards of this pest. The greatest success had been obtained by spraying the orchards with

arsenate of lead between the seventeenth and twentieth of July, this being the time of emergence. One application was found to be sufficient during a dry summer.

Dr. Leonard spoke of the work being done by the Experiment Stations in Porto Rico. Among those entomologists who are at the various Experiment Stations are the Doctors Wolcott, Danforth, Sein, and Osborn. Dr. Leonard said that the formal projects on the insect pest activities on the island were progressing, particularly the work on the bean aphids.

ELIZABETH SHERMAN, *Secretary*

MEETING OF FEBRUARY 2, 1932

A regular meeting of the New York Entomological Society was held on February 2, 1932, in the American Museum of Natural History; President Andrew J. Mutchler in the chair with sixteen members and seventeen visitors present.

The minutes of the preceding meeting were read.

The program committee reported Dr. Copeland and Dr. Hartzell as the speakers for the next meeting.

Dr. Byrley F. Driggers was elected to membership in the Society.

The resignations of Mr. Maydell and Dr. Gehring were accepted with regret.

Mr. Curran announced that Dr. Creighton had been called out of town and would be unable to give his paper at this time.

Dr. Driggers spoke on "Cocoon Parasites of the Oriental Fruit Moth." His paper will appear in the JOURNAL of the Society.

There followed a discussion of Dr. Driggers' paper concerning the methods of scientific control and the results obtained from the research which had been done in this field of parasitism.

Dr. Filmer and Dr. Pepper both said a few words of greeting, to the Society, expressing their pleasure in being able to attend the meeting.

Mr. Safro spoke at some length on the importance of odors which may affect insect migration. He likened perfumes to musical compositions in that they are all symphonies of various odors, which when happily combined are pleasing to the very imperfect sense of smell in man. It is possible to combine odors and get a zero result or no odor at all. There is every reasons to believe that odor detection in insects is much more highly specialized than in man. Because of this innate human inability in detecting odors it is hopeless to attempt to describe odors on the basis of human perception.

Dr. Moore spoke of a test given at the recent meetings in New Orleans to determine the exact taste of some small capsules. Here again the human mechanism proved to be very inaccurate, the majority indicating the taste to be a bitter one, while some declared that the capsules had no taste; and various others said that they were sour or had various other peculiar tastes.

Mr. Curran spoke in defense of those entomologists who name insects,

stating that up to 1924 the Oriental peach moth was not known to exist in Canada. At that time, however, a shipment of fruit was found to be infested with this pest. Upon investigation it was ascertained that the Oriental peach moth had been present in Canada for some time but the inexpert authorities had been calling it Curculio.

ELIZABETH SHERMAN, *Secretary*

MEETING OF FEBRUARY 16, 1932

A regular meeting of the New York Entomological Society was held on February 16, 1932, in the American Museum of Natural History; President Andrew J. Mutchler in the chair with twenty-seven members and thirty-seven visitors present.

The minutes of the preceding meeting were read and approved.

The program committee announced Dr. Melander and Mr. J. C. Crawford as the speakers for the next meeting.

Dr. Herman Spieth, of the College of the City of New York, was proposed for membership in the Society.

Mr. Sherman exhibited the new book by Drs. Brues and Melander—"Classification of Insects"—a key to the known families of Insects and other terrestrial Arthropods, both in their adult and immature stages and covering the entire world. He called attention especially to the 107 pages of bibliographies of various orders, and to the index of some 8,000 family and generic names, and mentioned that, in the text, all scientific names are properly accented. The book is the complete volume 73 of the Bulletin of Comparative Zoology, at Harvard University and is sold by the University, bound at $6.50.

Dr. Janvrin exhibited a small light perforated aluminum container for naphthaline in insect boxes, which his wife had invented.

Mr. Copeland spoke on "Insect Coloration," his paper being one of the series on Biology of Insects.

Mr. Safros humorously cited the insect known always as the "Pink and Green Aphis" the names of the colors being blended just as the words "ham and eggs" and the dual personalities of "Brues and Melander!"

Dr. Hartzell spoke on "The Physiological Action of Pyrethrum in Insects," as follows:

"The use of pyrethrum flowers as an insecticide dates back to the 16th century in Oriental countries. However, the chemical nature of the active principles has only recently been determined by Staudinger and coworkers.

"Many questions such as their stability, keeping qualities, compatibility with soap, and the accuracy of the analytical methods are still in dispute.

"The following was performed in order to throw light on some of these points. This work was done in cooperation with Dr. Frank Wilcoxon, a chemist.

"The relation between pyrethrin content and toxicity was determined by testing a series of dilutions of known content on the bean aphis (*Aphis*

rumicis). It was found that whenever two samples showed a significant difference in toxicity by the biological test the analytical result confirmed this fact.

"Pyrethrum concentrates are toxic to insects and a whole series of cold blooded animals including frogs and earthworms. These concentrates were found to be toxic when applied externally to the integument, even when not in the immediate vicinity of vital organs.

"The anterior end of a tomato worm was found to be more susceptible to these extracts than the posterior end.

"The temperature at the time a pyrethrum spray is applied is an important factor. The process of death and recovery are both accelerated depending upon the dose applied."

In reply to Dr. Moore's question he stated that the solvent used in the experiments cited in his paper was acetone and stated also that the same effects resulted if the pyrethrum were used direct.

Mr. Curran mentioning, that adult beetles were seldom found parasitized by flies—such cases occurring unusually in the family Chrysomelidæ—exhibited a specimen of Carabus sent from British Columbia, the abdomen of which contained four pupal cases and also the new species of tachinid fly, with unusual characters, reared from one of these pupæ.

Mr. Angell exhibited two lucanid beetles, one being a new race of *Lucanus dama* from Arkansas.

Dr. Melander exhibited a closely packed box of insects collected in southern Florida during a trip of four weeks in January and February.

President Mutchler exhibited a specimen of *Prionus laticollis* from the Slosson collection, with three tarsi springing from the left hind tibia.

Mr. Bell reported taking the fly *Syrphus torvus O.S.* at Flushing on February 7th.

Mr. Curran announced that Mr. Frank M. Jones would speak at one of the April meetings.

Mr. Cooper reported taking many Staphylinidæ this winter from rotten cabbage.

Mr. Beckwith, of the Cranberry Experiment Station, stated that he was very glad he had driven 80 miles from Pemberton, N. J., in order to attend the meeting.

JOHN D. SHERMAN, JR., *Secretary—Pro tempore*

MEETING OF MARCH 1, 1932

A regular meeting of the New York Entomological Society was held in the American Museum of Natural History on March 1, 1932, at 8: 15 P. M.; President Andrew J. Mutchler in the chair with twenty-seven members and nineteen visitors present.

The minutes of the preceding meeting were approved as read.

The program committee announced that Dr. Kendall and Dr. Pollard would be the speakers at the next meeting.

Dr. Herman Spieth, The College of the City of New York, was elected an active member of the Society.

J. Douglas Hood, of the University of Rochester, Rochester, New York, was proposed for membership in the Society.

Dr. Melander spoke on "Host Selection and Biological Races," the fifth talk in the Biological Series. The behavior of an insect, that is its instincts or tropisms, is a manifestation of the insect's urge for "self-preservation" and "race perpetuation." This biological urge, which is found throughout the animal kingdom, leads the insect to selective food habits and selective egg-laying habits. The various species of the same family may differ in these selective habits, thus we have "orange honey" and "apple honey"; upper-surface leaf miners while members of the same species are lower-surface leaf miners. In the case of those insects which have been found to have more than one host, this fact has been capitalized for purposes of saving a crop from too serious infestation where total destruction of the insects is not possible. Thus, the strawberry farmer places a mixture of dried apples and magnesium arsenate near his strawberry patch which proves to be more attractive to the strawberry root weevil than strawberries and is therefore termed "weevil lure." In using repellents it is necessary to get "the worm's eye point of view" for successful results. Host selection may be different during the various stages of development of an insect, thus showing that an insect, as an adult, has no memory of what it did as a larva. The adult moth does not eat cabbage as does the larva. Also it is necessary for the adult to select the appropriate food on which to lay its eggs, for, given the wrong food, an insect will live, but with a free choice it continues to select the same food or host from generation to generation.

Mr. Crawford read a paper on "The Observations on Peculiarities of Bees, Wasps, Ants, etc." He spoke of the various hymenopterous parasites; the ink that the medievals derived from large wood galls; the alternation of generations; the necessity of the fig insect, which lays its eggs in the blossom of the wild fig, for pollinating the Smyrna figs in this country. Mr. Crawford then showed some very interesting slides, among which were views of the nests of Harvester ants, mud daubers, potter wasps, paper-making wasps, and also diagrams showing the types of legs necessary for collecting honey.

ELIZABETH SHERMAN, *Secretary*

MEETING OF MARCH 15, 1932

A regular meeting of the New York Entomological Society was held on March 15, 1932, in the American Museum of Natural History, at 8: 15 o'clock; President Andrew J. Mutchler in the chair with twenty members and twenty-two visitors present.

The minutes of the preceding meeting were approved as read and corrected.

The program committee announced that Dr. Creighton and Dr. Jones would be the speakers at the next meeting.

It was moved and seconded that the secretary cast a vote unanimously electing J. Douglas Hood, of the University of Rochester, an active member of the Society.

Mr. George Sanders, 981 Seneca Ave., Brooklyn, N. Y., was proposed as an active member of the Society.

Mr. Davis exhibited the Bulletin 157 of the United States National Museum, a monograph on "The Butterflies of the District of Columbia and Vicinity," by Austin H. Clark, and commented on the excellence of the text and the 64 plates.

Circulars concerning the Fifth International Congress of Entomologists in Paris, 1932, were distributed.

An article "Three Hundred Years of Tom Thumb," by Mr. Harry B. Weiss, appearing in Scientific Monthly was shown. Its entomological interest was contained in a figure representing the spider, his web, and the butterfly.

Dr. James Kendall, the sixth speaker in the series on Biology of Insects, gave a paper on "Gall Insects." He reviewed the work of Cuzens and of Lutz on the starch digestion of the cynipid gall and of the aphid gall as a possible explanation of gall growth. An induced chemical does produce growth but this does not explain gall growth. Galls are caused by a complexity of factors due to the quantity of sap in the plant, the nature of the secretion of the insects, and the organisms present in the plant tissue. They are the manifestation of the effort on the part of the plant to localize the effect of irritation at the point of infestation.

Dr. C. L. Pollard read a paper on "Psychic Genera." Quoting a statement made some years ago by the botanist Dr. Edward Lee Greene, Dr. Pollard said that he was convinced that there exist in nature perfectly valid genera which may be indistinguishable from their nearest allies; also that characteristic genera of this type should not be divided on insufficient characters. He cited Ornithoptera as an example of the first type, and Argynnis as one of the second claiming that both were natural genera; and as in these cases the differentiation is partly intuitive, he used the phrase "psychic genera" to define them.

Dr. Spieth gave a very lucid account of the work he has been doing on the wing venation of Mayflies. In 1922 Lameere advanced the theory of regular alternation of veins, that is, one vein alternates behind another in Mayflies, resulting in the convex veins on the upper surface and the concave veins on the lower surface of both the hind and fore wings. A crossvein may take the place of an old attachment of a concave vein. There is, however, too much variation in wing venation to make a stable classification therefrom.

Mr. Curran stated that in the higher order, the upper and lower surfaces are united, while in the lower orders the light is reflected from this alternation of veins.

Mr. Coates exhibited some moth cocoons collected from Rio Negro on Andros Island. These white cocoons closely resemble lizard eggs. The

only insect found was a very large Megacoma over 3 inches in length and a perfect specimen.

Mr. Curran exhibited a mosquito and its eggs perfectly mounted by pressure on a sheet of paper. He also showed a cocoon of a cecropid moth containing hymenopterous parasites around which the cecropia was fitted. Also, he exhibited a tomato Sphinx caterpillar to which were attached many small, white braconid cocoons.

ELIZABETH SHERMAN, *Secretary*

MEETING OF APRIL 5, 1932

A regular meeting of the Society was held on April 5, 1932, at the American Museum of Natural History at 8:15 o'clock; President Andrew J. Mutchler in the chair with twenty-six members and twenty-five visitors present.

In the absence of the secretary, Mr. John D. Sherman, Jr., was appointed secretary pro tempore.

The program committee announced that Dr. Moore and Dr. Johnson would be the speakers at the next regular meeting.

George E. Sanders was elected to active membership in the Society.

Dr. William S. Creighton, of the College of the City of New York, read a paper on "Chordontal Organs and Insect Communication," one of the series on the Biology of Insects. He stated that the structure of these organs, defined as organs containing scolopales or "auditory rods," has been well known for a long time, but that their real functions are still quite obscure, and that many different conclusions have been drawn as to their real use. Dr. Creighton spoke also on Insect Communications, mentioning the rhythmic circling movements of bees returning from their expeditions after food as observed by von Frisch who took fine moving pictures of them. Also he mentioned the similar movements of harvesting ants as studied by Hingston.

Dr. F. M. Jones, speaking on "Insect Coloration and the Relative Acceptability of Insects to Birds," gave a very interesting account, with slides, "of a long series of experiments with wild birds, entirely unconfined, and involving insects of more than two hundred species. The results were interpreted to signify a definite discrimination by the birds against certain types of insect coloration, these in some instances correlated with chemical factors whose deterrent character was proven in other experiments in which coloration was eliminated. If some types of coloration are to be considered protective, that protection is not complete, but at most relative and partial."

Dr. Jones spoke also of the conclusions of Heikertinger and McAtee and others on the subject of protective coloration, etc.

Dr. Jones' paper was discussed by Dr. Mayr and Dr. Creighton at some length.

JOHN D. SHERMAN,
Secretary-Pro tempore

MEETING OF APRIL 19, 1932

A regular meeting of the New York Entomological Society was held on April 19, 1932, in the American Museum of Natural History at 8: 15 o'clock; President Andrew J. Mutchler in the chair, with twenty-four members and seventeen visitors.

The minutes of the two preceding meetings were approved as read and corrected.

The program committee announced that Dr. Biddle would speak on parthenogenesis at the next regular meeting.

Mr. Davis spoke of the recent death of the Rev. C. J. S. Bethune at the age of 93 years. Mr. Davis commented on the excellent work of Rev. Bethune as editor of the *Canadian Entomologist.*

Dr. Herbert Johnson spoke on "Polyembryony," the seventh paper in the Biology of Insects series. (See statement at end of minutes.)

Dr. William Moore spoke on "Resistant Scale Insects," saying that it was a problem not yet begun and one that he was going to California to attempt to solve. In Southern California there are three scale insects injurious to citrus, that have developed, by natural selection, a resistance to hydrocyanic acid in a dosage sufficient to kill. These scales are the *citrocollis* scale, a hot weather insect, the black scale, very abundant in the coastal regions, and the red scale, also found in the coastal regions. In appearance, the resistant individuals are identical with the non-resistant. Dr. Moore is particularly concerned with the distribution of these resistant strains and also with the development of an efficient method of fumigation which will break down the resistance already developed by these scales. He is anxious to receive suggestions along these lines. It is believed that climatic conditions, when unfavorable, will develop a resistant race. For example, *citrocollis* is resistant only when found in cooler regions where, Dr. Moore said, the insects seem suddenly to have put on gas masks.

Mr. Safro stressed the importance of suggestions that might be received by Dr. Moore. He stated that chemists and entomologists had two years in which to solve this problem of resistant scale insects, and that its solution would mean millions of dollars to the citrus growers.

Dr. Melander spoke on his work with the San Jose scale in the state of Washington. In 1906 the lime sulphur spraying was not proving effective in Snake River County. The Clarkson County scales were harder to kill than any other but it was found that they were 100 per cent susceptible to an oil spray. Dr. Melander found that there were decided physiological differences of heredity variability in the scale insects as they occur in Washington.

Dr. Felt mentioned the advantage of using more than one gas in fumigation.

Mr. Safro discussed Dr. Felt's suggestion, saying that better results might be had by the mixture not of two toxic gases but by the mixture of one toxic gas with a non-toxic gas. For instance, toxic gas with oxygen,

which would increase the metabolic rate of the insect and thereby lower the resistance.

ELIZABETH SHERMAN, *Secretary*

POLYEMBRYONY (Abstract)

By H. HERBERT JOHNSON, Department of Biology, College of the City of New York.

Polyembryony, the development of many embryos from one egg, has arisen independently in five groups of insects: Strepsiptera, Serphoidea, Chalcidoidea, Ichneumonoidea, and Vespoidea. Polyembryony may be induced experimentally in certain invertebrates, and occurs exceptionally in vertebrates, as exemplified by identical twinning in man. It is the rule in the Armadillo, which forms four embryos from one fertilized egg.

Three species of *Platygaster,* a genus of parasitic Hymenoptera, exhibit a series of steps in the development of polyembryony. *Platygaster herriki* is monoembryonic in development, but has a specialized type of egg. The egg lacks the customary chitinized envelope, and also is deficient in yolk. The polar-bodies, produced by the maturation of the egg, fail to degenerate, but, by division, form a nutritive membrane, the *trophamnion,* which has the property of absorbing food from the host tissues and transmitting it to the embryo. Not confined by a chitinized shell, the embryo increases its area considerably during its development. *P. hiemalis* develops either monoembryonically, or the embryonic mass may divide once, producing twins. *P. vernalis* always develops by polyembryony.

The process becomes very complicated in certain Chalcidoidea, which may produce 2,500 young from one egg. Multiplication takes place in three ways. The first sixteen cells of the embryo may disjoin from one another to form separate embryonic growing centers or germs. Each of these may divide one or more times into smaller germs. Eventually a germ produces a compact mass of cells, the morula, but this may also divide by fission into two morulas, each of which produces a larva.

Dr. Johnson suggested that polyembryony in insects seems to be the first step in the development of an alternation of generations, as in certain Annelids and Coelenterates, in which the sexual phase is invariably followed by an asexual larva the body of which divides by fission.

The view of Marchal and Imms, that polyembryony results from a division of the embryonic mass brought about by osmotic pressures in the surrounding fluids, was criticised as perhaps inadequate to account for all of the facts. Stockard has shown that fish embryos divide to form Siamese twins if the metabolic rate is lowered beyond the normal. The lack of yolk in the polyembryonic insect egg, coupled with the difficulty of effecting proper contact between the embryonic body and the host tissues, introduces a factor which probably results in a lowered metabolic rate during the crucial early formative period. This factor alone, on the basis of Stockard's theory, may account for the fission of the embryonic mass, perhaps assisted by the osmotic pressures hypothecated by Marchal and Imms.